

Airborne measurements of Peroxy radical during EMeRGe

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Abstract

The amount, distribution and role of peroxy radicals, HO₂ and RO₂ (where R is an organic group) in tropospheric air masses are of key importance for the assessment and interpretation of the transformation and processing of polluted outflows from major population centres (MPC). This issue has been investigated within the EMeRGe project (Effect of Megacities on the Transport and Transformation of Pollutants on the Regional to Global Scales) for selected MPCs. The reactions of these radicals play a key role in the catalytic oxidation of hydrocarbons. Thereby they determine the O₃ budget and the oxidation capacity of the atmosphere (OCA).

Airborne measurements of the total sum of peroxy radicals, RO₂* = (HO₂ + ∑ RO₂), have been conducted within EMeRGe by using PeRCEAS (Peroxy Radical Chemical Enhancement and Absorption Spectrometer), which is part of the EMeRGe payload in the HALO research aircraft (www.halo.dlr.de). PeRCEAS successfully participated in the EMeRGe HALO campaigns in Europe in summer 2017 and in Asia in spring 2018. Air masses of different photochemical activity and significant RO₂* mixing ratios up to 100 pptv were measured.

This presentation will describe the preliminary findings of the RO₂* mixing ratios observed upwind and downwind of the selected MPCs.